

# OAR

## Office of Oceanic and Atmospheric Research

Serving Society Through Science

Chris Moses, Ph.D.

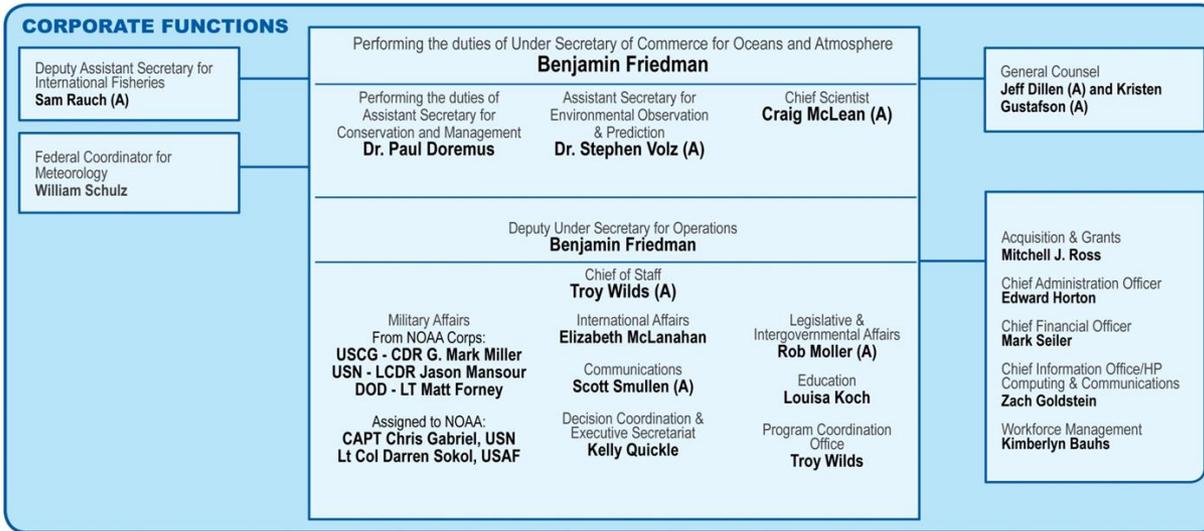
NOAA

Oceanic & Atmospheric Research

**[research.noaa.gov](https://research.noaa.gov)**



# NOAA HEADQUARTERS ORGANIZATION



## LINE OFFICES

## Oceanic and Atmospheric RESEARCH

Assistant Administrator  
National Marine Fisheries Service (NMFS)  
**Sam Rauch (A)**

Deputy Assistant Administrator for Operations  
**Dr. Paul Doremus**

Deputy Assistant Administrator for Regulatory Programs  
**Samuel Rauch**

Director of Scientific Programs & Chief Science Advisor  
**Dr. Cisco Werner (A)**

**NMFS ORGANIZATION**

Assistant Administrator National Ocean Service (NOS)  
**Dr. Russell Callender**

Deputy Assistant Administrator  
**Nicole LeBoeuf**

**NOS ORGANIZATION**

Assistant Administrator National Environmental Satellite, Data & Information Service (NESDIS)  
**Dr. Stephen Volz**

Deputy Assistant Administrator  
**Mark S. Paese**

**NESDIS ORGANIZATION**

Assistant Administrator Oceanic & Atmospheric Research (OAR)  
**Craig McLean**

Deputy Assistant Administrator for Laboratories & Cooperative Institutes  
**Dr. Gary Matlock (A)**

Deputy Assistant Administrator for Programs & Administration  
**Ko Barrett**

**OAR ORGANIZATION**

Assistant Administrator National Weather Service (NWS)  
**Dr. Louis Uccellini**

Deputy Assistant Administrator  
**Mary Erickson**

**NWS ORGANIZATION**

Director Office of Marine & Aviation Operations (OMAO) & Director, NOAA Corps  
**RADM David A. Score**

Deputy Director for Operations and Deputy Director, NOAA Corps  
**RDML Anita Lopez**

**OMAO ORGANIZATION**



# noaa research VISION

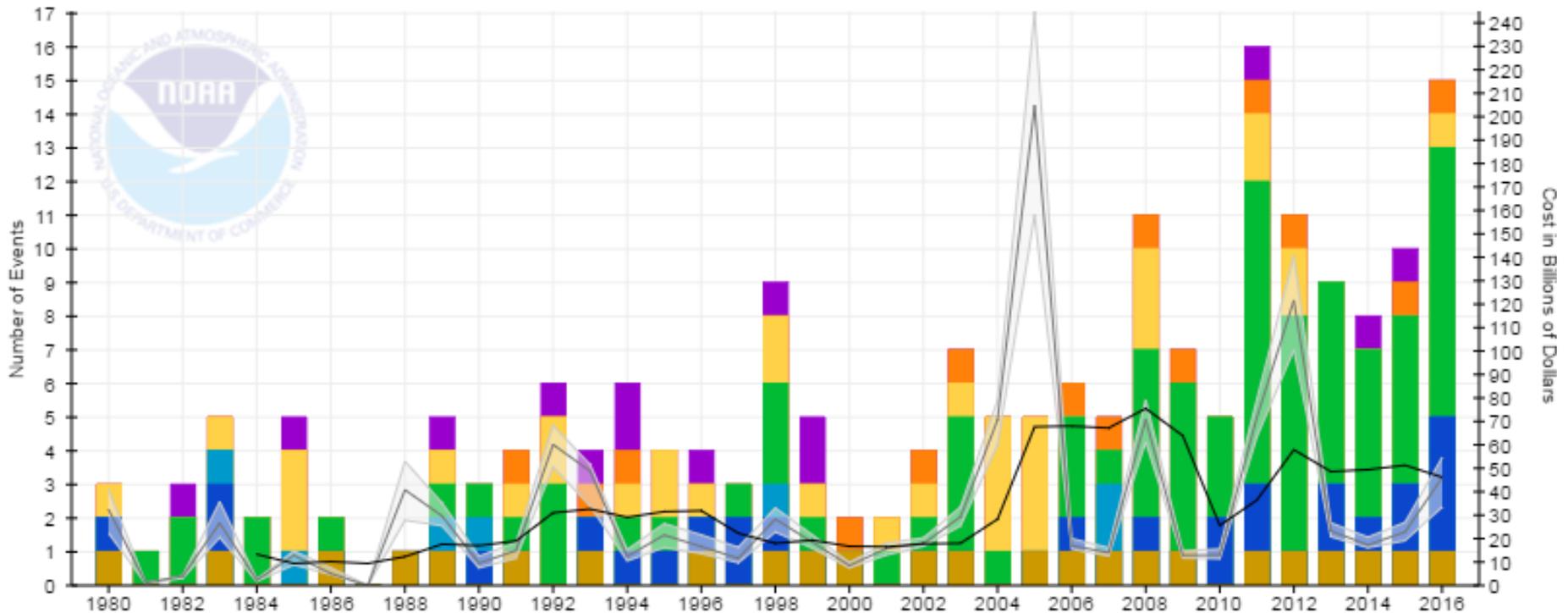
TO DELIVER  
noaa's future

# DEMAND

for NOAA's information and services is **growing**

### Billion-Dollar Disaster Event Types by Year (CPI-Adjusted)

- Winter Storm
- Wildfire
- Trop Cycl
- Severe Storm
- Freeze
- Flooding
- Drought
- Cost w/ 95% CI
- 5-Year Mean



# Without **research...**

Improved observations, new satellites and advances in research, modeling and supercomputing have led to hurricane track forecasts that are 40% more accurate, leading to greater forecast confidence.

2005

2015

Hurricane Katrina forecast



# noaa research MISSION

OAR's mission is to conduct research to understand and predict the Earth's **oceans**, **weather** and **climate**, to advance NOAA science, service and stewardship and transition the results so they are useful to society.

**OAR's SCIENCE PORTFOLIOS**  
**research for practical prediction**  
**WEATHER • OCEANS • CLIMATE**

# NOAA-SPECIFIC LEGISLATIVE MANDATES

## General

**NOAA innovative and transformational research:** Ocean and Atmospheric Research and Development, 33 U.S.C. §§ 893-893c (The America COMPETES Reauthorization Act of 2010)

**Cooperative Institutes:** Agreements to Aid and Promote Scientific and Educational Activities, 15 U.S.C. § 1540

## Weather Research

### General weather research:

Weather Service Modernization Act, Pub. L. 102-567, Title VII, 15 U.S.C. § 313 note, §§ 701-709

### US Weather Research Program:

National Oceanic and Atmospheric Administration Authorization Act of 1992, Pub. L. 102-567, Title I, § 108, 15 U.S.C. § 313 note ()

### Water prediction research

**activities:** Inland Flood Forecasting and Warning System Act of 2002, Pub. L. 107-253, 15 U.S.C. § 313c

### Tsunami research:

Tsunami Warning and Education Act, 33 U.S.C. §§ 3201-3207 ()

### Air chemistry and air quality

**research:** Clean Air Act, 42 U.S.C. §§ 7401-7431

## High Performance Computing

**High-Performance computing for applied research in weather prediction, ocean sciences, and**

**computational fluid dynamics:** High-Performance Computing Act of 1991, 15 U.S.C. §§ 5501-5528

## Ocean and Coastal Research

**National Sea Grant College Program:** National Sea Grant College Program Act, 33 U.S.C. §§ 1121-1131 & National Sea Grant College Program Act Amendments of 2002, 33 U.S.C. § 857-20

**Aquaculture competition:** National Aquaculture Act of 1980, 16 U.S.C. §§ 2801-2810

**Ocean Exploration and Research Program:** NOAA Undersea Research Program Act of 2009, 33 U.S.C §§ 3401-3421  
**Titanic site activities:** R.M.S Titanic Maritime Memorial Act of 1986, 16 U.S.C. §§ 450rr-450rr-6

- **Exploration and mapping of sanctuaries:** National Marine Sanctuaries Act, 16 U.S.C. § 1431-1445c-1
- **Exploration and mapping of areas of commercial recovery:** Deep Seabed Hard Mineral Resources Act, 30 U.S.C. §§ 1401-1473
- **Mapping activities:** Ocean and Coastal Mapping Integration Act, 3501-3507

**Ocean Acidification Program:** Federal Ocean Acidification Research and Monitoring Act of 2009, 33 U.S.C. §§ 3701-3708

**Ocean observations:** Integrated Coastal and Ocean Observation System Act of 2009, 33 U.S.C. §§ 3601-3611

**Great Lakes Environmental Research Laboratory:** Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1387

**Harmful Algal Bloom and Hypoxia research:** Harmful Algal Bloom and Hypoxia Research and Control Act of 1998, 16 U.S.C. § 1451 note, §§ 601-606, as amended by the Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2004 (Pub. L. 108-456) and the Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2014 (Pub. L. 113-124)

**Coral research activities:** Magnuson-Stevens Fishery Conservation and Management Act, as amended, 16 U.S.C. §§ 1801-1891d & Reef Conservation Act of 2000, 16 U.S.C. §§ 6401-6409

## Climate Research

### Climate research:

- General: National Climate Program Act, 15 U.S.C. §§ 2901-2908
- Climate Program Office and general: Global Change Research Act of 1990, 15 U.S.C. §§ 2921-2961

### International climate research:

International Cooperation in Global Change Research Act of 1990, 15 U.S.C. §§ 2951-2953

### Drought research and information:

National Integrated Drought Information System Act of 2006, 15 U.S.C. § 313d

### Arctic research:

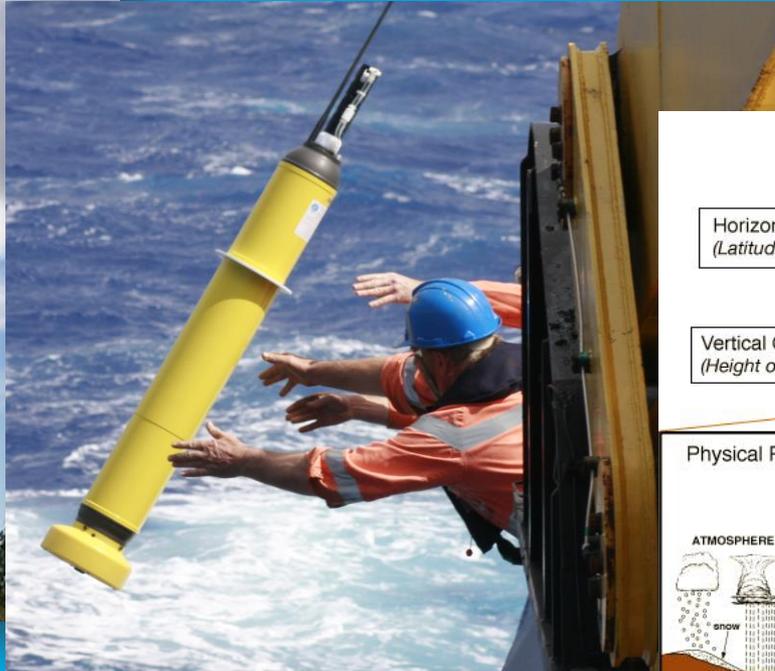
Arctic Research and Policy Act of 1984, as amended, 15 U.S.C. §§ 4101-4111



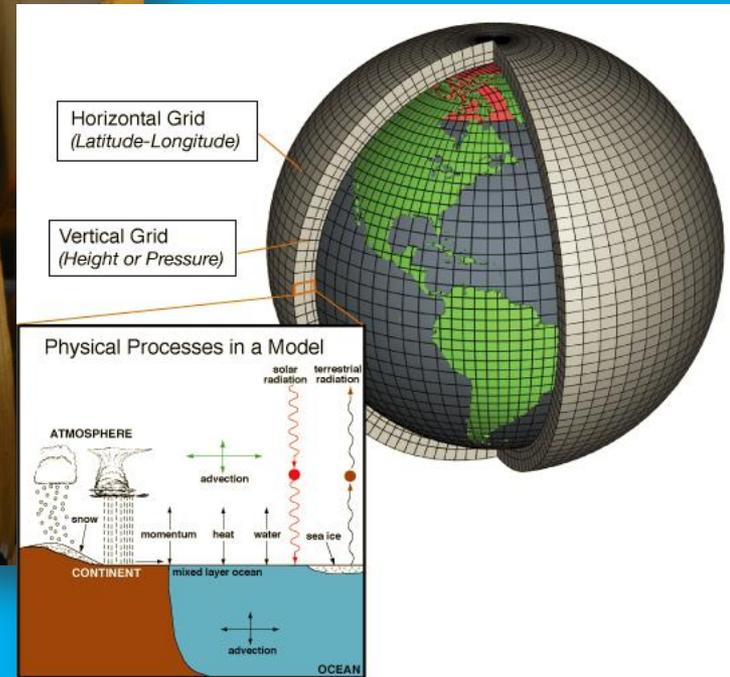
# We revolutionized the PAST



**Radar technology  
& data integration  
and visualization  
tools that  
modernized the  
National Weather  
Service**



**Argo - a worldwide  
ocean observing  
system**



**The first global climate  
models that coupled the  
ocean & atmosphere**

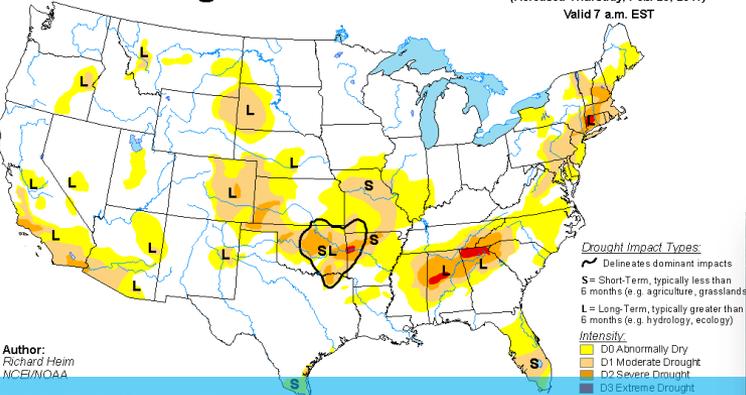


# We understand and assess

# the PRESENT

## U.S. Drought Monitor

February 21, 2017  
(Released Thursday, Feb. 23, 2017)  
Valid 7 a.m. EST



NIDIS - Drought.gov

<http://droughtmonitor.unl.edu>

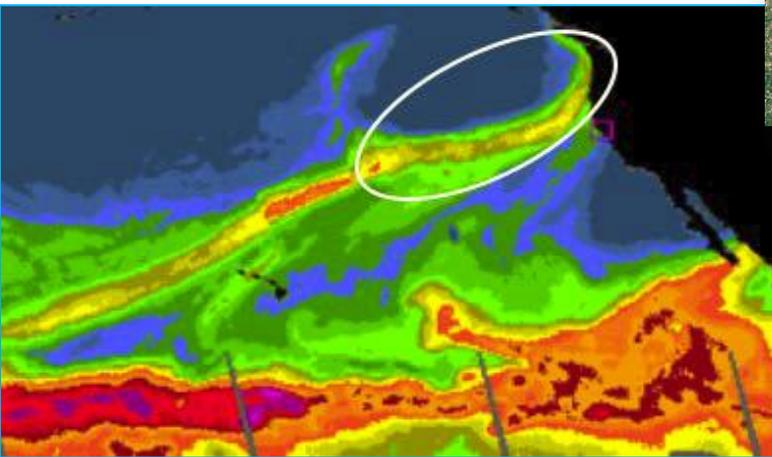


### Harmful Algal Bloom (HAB) in Lake Erie



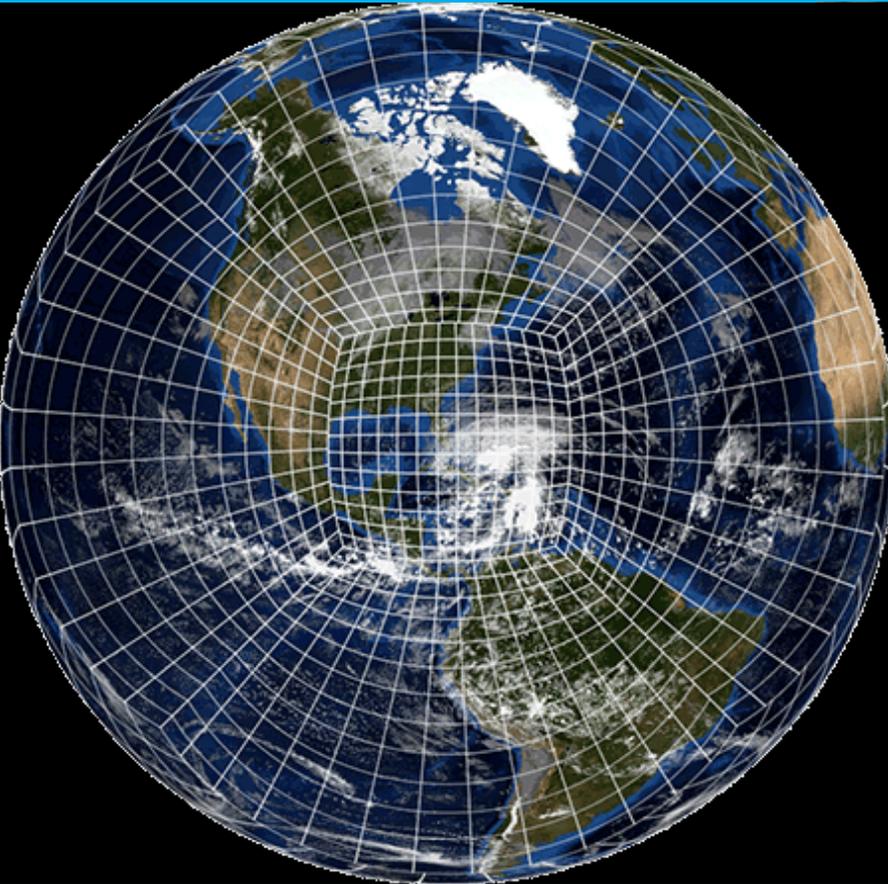
Photo credit: Taylor Shellfish

### Oyster hatchery industry intervention to protect from ocean acidification

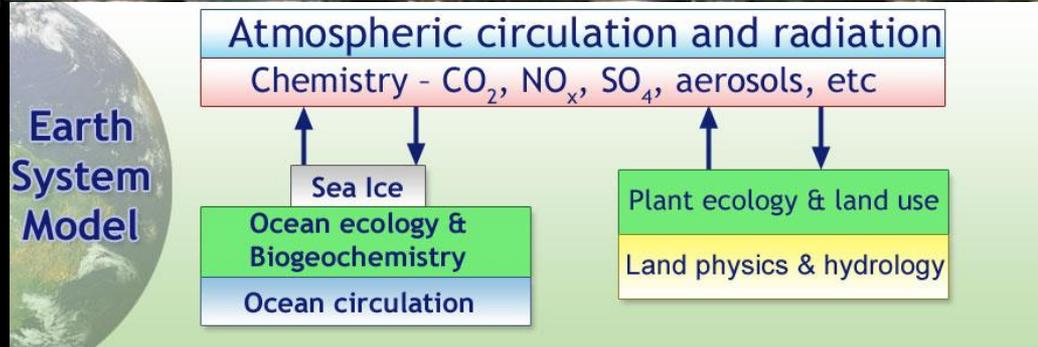


### Atmospheric river/ El Nino rapid response 2016

# We anticipate **the FUTURE**



**Climate vulnerabilities for economically important fish stocks**  
**Aquaculture**



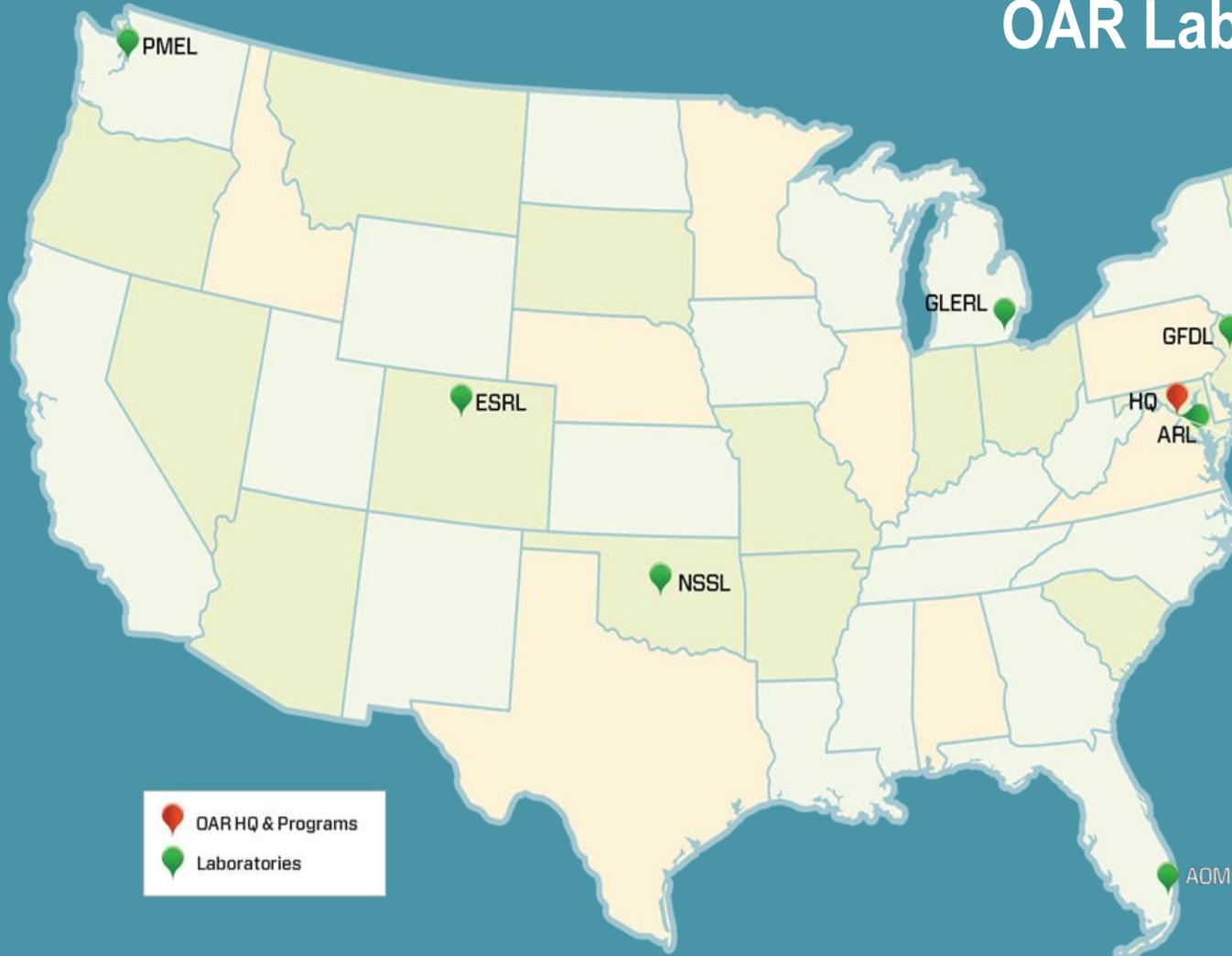
**FV3 - a dynamic core for a “Second to None” global weather model**

**Earth system processes & models**

# HUMAN INTELLECT

is our CAPITAL

## OAR Labs and Programs

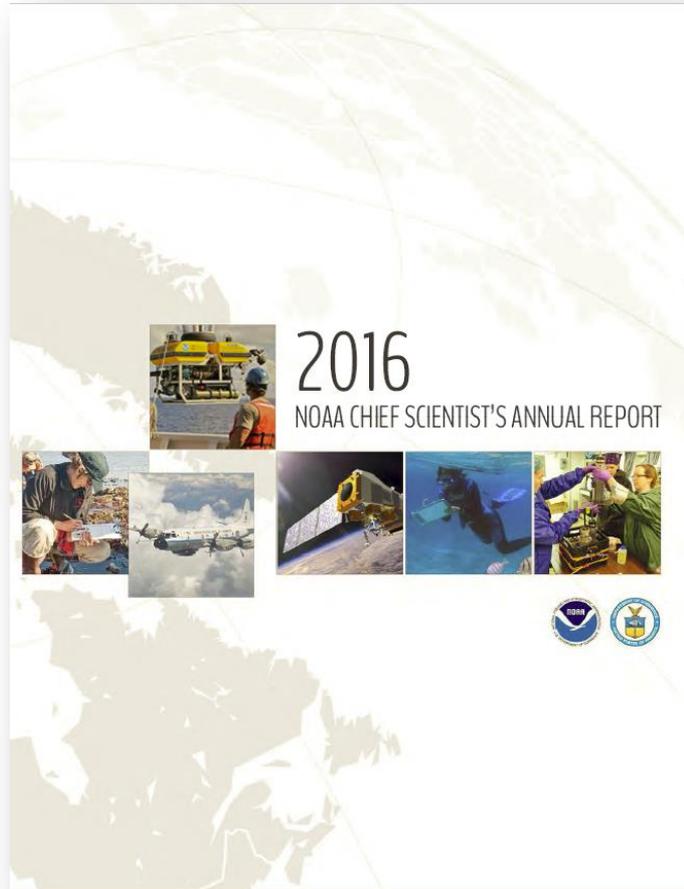


- Office of Weather & Air Quality
- National Sea Grant Program
- Office of Ocean Exploration & Research
- Climate Program Office
- Ocean Acidification Program
- Unmanned Aircraft Systems Program



# PREEMINENCE

is our standard



## Bibliometric Analysis Peer-reviewed publications 2011-2015

- NOAA published more articles in the field of **meteorology and atmospheric sciences** and in **oceanography** than any other federal agency.
- 24% of NOAA's 3578 articles in **meteorology and atmospheric sciences** fall within the top 10% of the most cited articles in this field.
- 20% of NOAA's 1426 **oceanography** articles fall within the top 10% of the most cited articles in oceanography.

# Integrating **ACADEMIA** into OAR is a key strategy...



...enriching our  
**knowledge base & capabilities**

We build

# **PARTNERSHIPS** with businesses

**Active Cooperative  
Research and  
Development  
Agreements (CRADAs)  
with OAR**

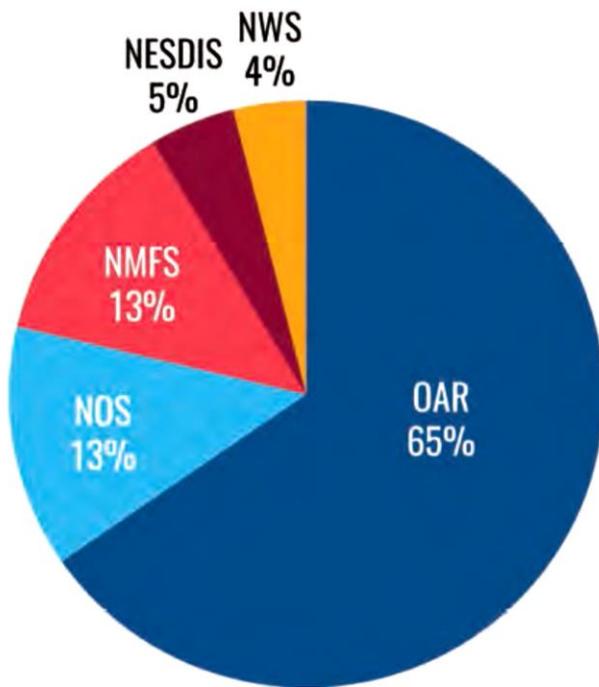
Trimble Navigation Ltd  
Willis Re Inc.  
Batelle Memorial  
Institute  
Paroscientific Inc.  
Weston Solutions, Inc.  
Sigma Space Corp.  
The Boeing Company  
Liquid Robotics  
Saildrone, LLC  
AeroVironment, Inc.

Science Application International  
Corporation (SAIC)  
Auraia, LLC  
Big Data Consortium  
Google, Inc.  
Prioria Robotics  
Precision Aviation, LLC  
IMSG  
Scintec  
UAV Solutions  
Latitude Engineering

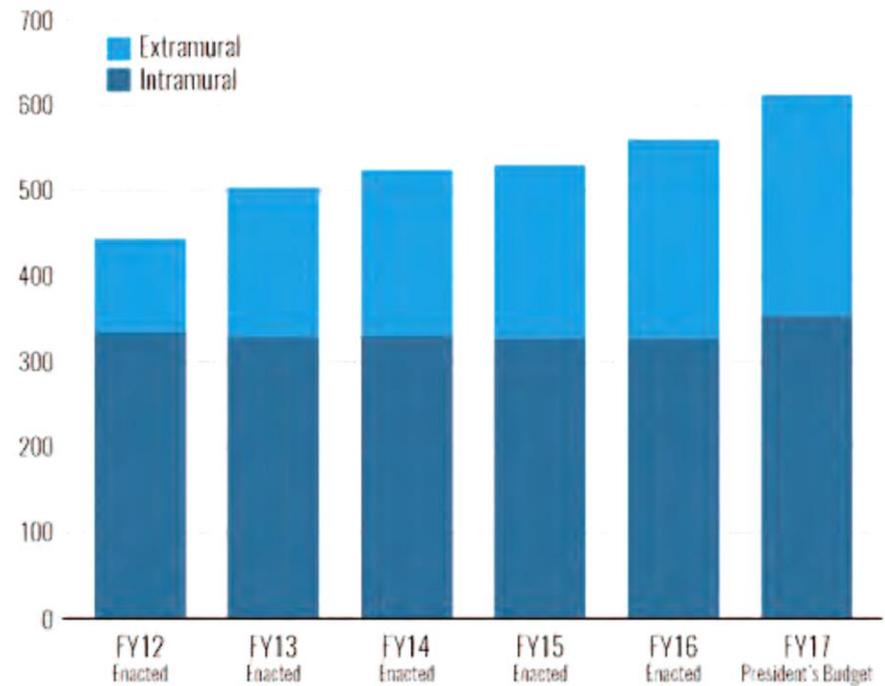
to enrich our  
**knowledge base & capabilities**

# NOAA R&D BUDGET

## FY16 Enacted R&D Budget by Line Office



## Total NOAA R&D Budget (\$ millions)



# OAR LEADERSHIP



**Craig McLean**  
Assistant Administrator for  
Oceanic & Atmospheric  
Research



**Ko Barrett**  
Deputy Assistant Administrator  
for Programs and  
Administration



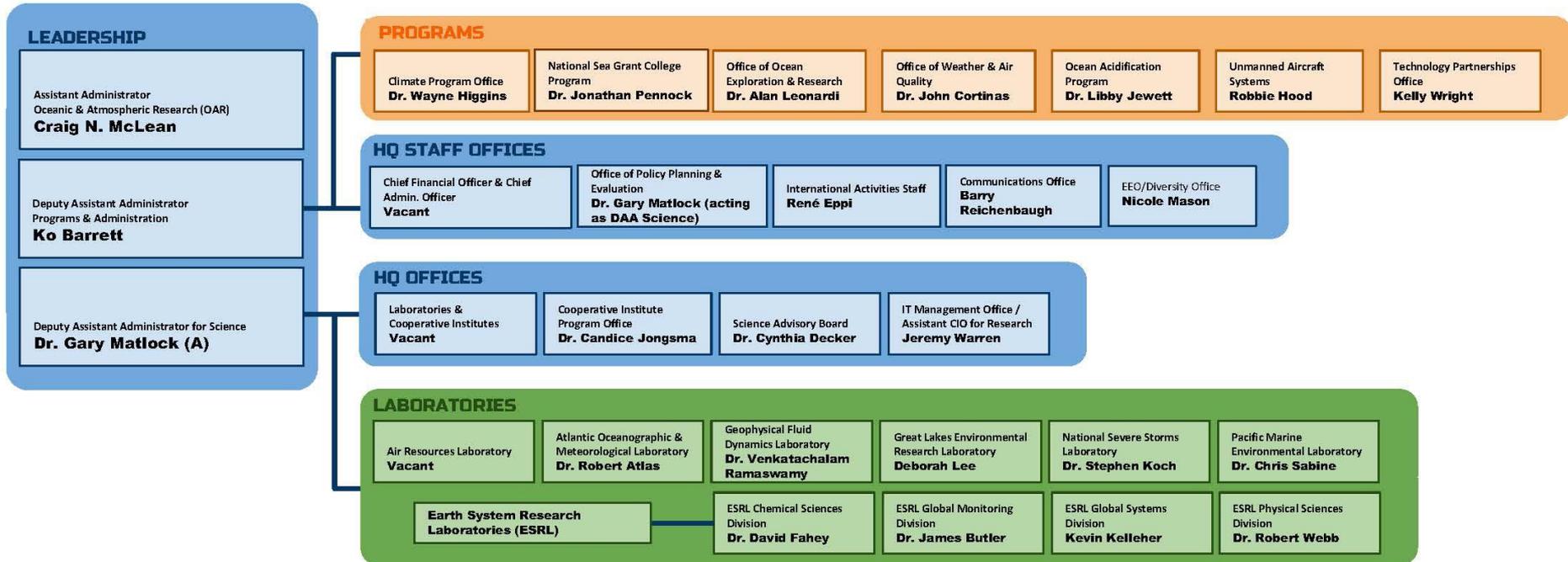
**Dr. Gary Matlock**  
Acting Deputy Assistant  
Administrator for Science

[research.noaa.gov](https://research.noaa.gov)

Thank you

# ADDITIONAL SLIDES

# OAR ORGANIZATION



NOAA Research Organizational Chart  
January 19, 2017